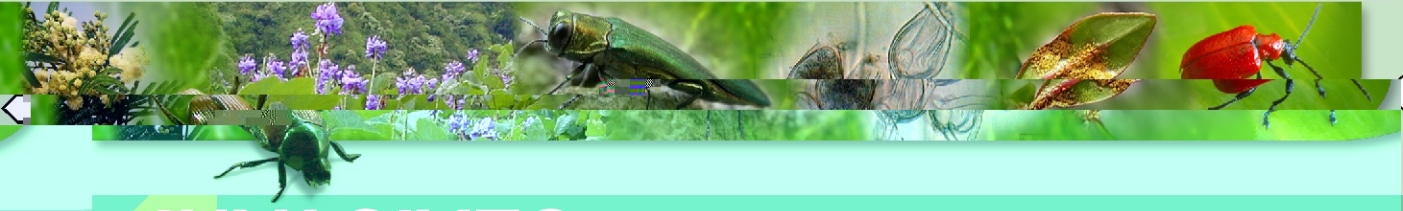

APFISN

INVASIVES

Newsletter of the Asia-Pacific Forest Invasive Species Network (APFISN)

Volume 18 September - October '08

Threats

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New publications

- Use of native range surveys to determine the potential host range of arthropod herbivores for biological control of two related weed species, *Rhamnus cathartica* and *Frangula alnus*
- Exotic invasive knotweeds (*Fallopia* spp.) negatively affect native plant and invertebrate assemblages in European riparian habitats

Nitrogen allocation, partitioning and use efficiency in three invasive plant species in comparison with their native congeners

Predicting dispersal and recruitment of *Miconia calvescens* (Melastomataceae) in Australian tropical rainforests

Predicting invasive plants in Florida using the Australian weed risk assessment

The spread of invasive species and infectious disease as drivers of ecosystem change

A dispersal constrained habitat suitability model for predicting invasion of alpine vegetation.

Recent books

- Biological Control of Tropical Weeds using Arthropods
- Applied weed science: Including the ecology and management of invasive plants (3rd edition)

Forthcoming Symposia/Workshops

- 1 - 3 December 2008. Asia and the Pacific Forest Health Workshop - Forest Health in a Changing World. Kuala Lumpur, Malaysia

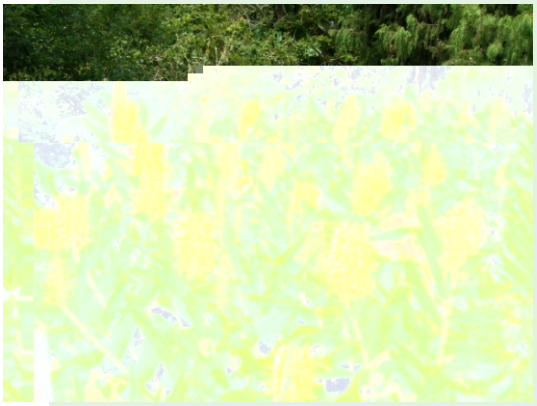
The Asia-Pacific Forest Invasive Species Network (APFISN) has been established as a response to the immense costs and dangers posed by invasive species to the sustainable management of forests in the Asia-Pacific region. APFISN is a cooperative alliance of the 33 member countries in the Asia-Pacific Forestry Commission (APFC) - a statutory body of the Food and Agriculture Organization of the United Nations (FAO). The network focuses on inter-country cooperation that helps to detect, prevent, monitor, eradicate and / or control forest invasive species in the Asia-Pacific region. Specific objectives of the network are: 1) raise awareness of invasive species throughout the Asia-Pacific region; 2) define and develop organizational structures; 3) build capacity within member countries and 4) develop and share databases and information.

INVASIVES, bimonthly newsletter of the Asia-Pacific Forest Invasive Species Network (AFPISN) is intended to share information among countries in the Asia-Pacific region on Forest Invasive Species(FIS) and the threats they pose in the region. If you have any items of news value on FIS to share between national focal points of APFISN and more widely among foresters, agriculturists, quarantine personnel and policy makers, please pass them on to the editor - Dr. K. V. Sankaran, APFISN Coordinator, Kerala Forest Research Institute, Peechi-680 653, Kerala , India (sankaran@kfri.org). The newsletter is supported by the Food and Agriculture Organization of the United Nations (FAO) and USDA Forest Service.

Kahili ginger (*Hedychium gardnerianum*)

Hedychium gardnerianum (Kahili ginger or wild ginger) is a perennial ornamental herb growing in wet climates from sea level to 1700 meter altitudes. A native of Eastern India, the plant is nominated as one among 100 of the world's worst invaders. It is now distributed throughout the tropics invading natural forest ecosystems. Affected countries include Federated States of Micronesia, Fiji, New Caledonia, Cook Islands, Australia, French Polynesia, Hawaii, New Zealand, La Reunion Island (France), South Africa and Jamaica. It has been introduced around the world mainly through horticultural trade.

Kahili ginger- Inflorescence



Kahili ginger - Infestation

Wild ginger is a coarse perennial herb with leafy shoots which are 1.5 - 2 m tall. It grows from large branching rhizomes (tuberous shoots) of up to 3.5 cm in diameter. The rhizomes are internally pale and fragrant. They grow vertical stems, up to 10 cm long and form rhizome beds of up to 1 meter in thickness. Leaves ovate-elliptic, 20 - 45 cm long, 10 -15 cm wide, glabrous or sparsely pubescent along midrib on lower surface, apex short-acuminate, petioles 1 - 2 cm long, ligules membranous, 1.5 - 3 cm long, entire or very shallowly 2-lobed, glabrate, sheaths glabrous or glabrate. Inflorescence yellowish, erect, cylindrical, 16 - 30 (- 45) cm long, primary bracts widely spaced, ovate-elliptic, spreading or obliquely ascending, enfolding the cincinni, much shorter than the floral tube, 3 - 5 cm long, glabrous, rachis glabrous, exposed, cincinni 2- flowered; calyx cylindrical, 3 -lobed, 3 - 3.5 cm long; corolla yellow, the tube longer than the primary bract, 5 - 5.5 cm long, the lobes greenish yellow, linear, 3.5 - 5 cm long; labellum centrally tinged orange, 2.5 - 3 cm long; stamen bright reddish orange, far exceeding labellum, ca. 6.5 cm long; lateral staminodes yellow, ca. 3 cm long; ovary glabrous. Capsules oblong, ca. 1.5 cm long, the valves orange within. Seeds are a bright scarlet red, measure 6 by 4mm, and over 100 seeds may be produced per flower head.

The Rhizomes of the plant are the primary source of spread. Even small pieces of the rhizome can grow into a new plant. The fleshy red seeds are spread by birds and also through garden waste. The plant also exhibits clonal reproduction, with the small root fragments with the potential to re-sprout making it difficult to control. It grows in open light environments, prefer warm moist climate and can also grow in full shade beneath a forest canopy. Wild ginger occurs in agricultural areas, coastland, natural forests, planted forests, range and grasslands, riparian zones, ruderal and disturbed areas, scrub and shrub-lands, urban areas and wetlands. It may form dense growth in native forests, smothering young native seedlings and displacing them. This results in alteration of native forest habitats and ecosystems and in the degradation of native forest communities. It may also block stream edges, altering water flows. In some instances forest regeneration can be completely prevented. Aircraft-based analysis has shown that the plant reduces the amount of nitrogen in the metrosideros forest canopy in Hawaii, a finding later corroborated by ground based sampling. Such alteration in natural ecosystem processes could alter the type of fauna that lives in those habitats.

Fruits and seeds of Kahili ginger

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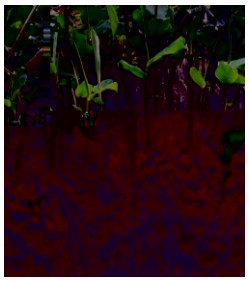
Manual removal of the weed is an option for controlling local infestations. Small seedlings can be pulled out by hand. Removing the flower heads from Kahili ginger does not kill the plant but does slow down its spread. If the seeds are not fully formed the flowers can be left on the ground. If the



Rhizome of kahili ginger

seeds have formed, flowers need to be disposed of in rubbish bags. Isolated small plants can be grubbed out and the rhizomes removed. Stalks and roots are hard to burn and should not be composted. Metasulfuron-methyl and glyphosate are the common herbicides recommended for the control of the weed. The herbicides may be sprayed lightly on the leaves and roots from spring to late autumn. After the plants are killed, care should be taken not to remove the leaves or stalks until they have gone brown and dried out. This will normally take three to four months.

Biological control of kahili ginger

Biological control is apparently the only practical approach for the long-term management of Kahili ginger infestations. *Ralstonia* (= *Pseudomonas*) *solanacearum*, a host specific bacterium which cause Kahili ginger wilt has been identified as a potential biological control against the weed.

News column

China's biodiversity threatened by invasive foreign species

China, a biodiversity 'hotspot', is under threat from over 400 invasive species, and its annual economic losses from alien insects and plants are estimated at US$14.5 billion. China's rapid economic development has encouraged the spread of invasive species, says an article in the April issue of BioScience. The ChinaUS team says that invasive animal species increased from 1990 to 2003 by more than 30 per cent and invasive plant species tripled between 1995 and 2003. The quarantine and inspection are inadequate in China, and growth of the country's industrial and transportation infrastructure has assisted the spread of unwanted species. Growing transportation networks like the QinghaiTibet railway help spread of invasive species to remote regions, says Ding Jianqing from the Wuhan Botanic Garden of the Chinese Academy of Sciences. In 2002 - 04, Beijing introduced a variety of foreign plants with a view to 'greening' the Olympic games. These species, though not invasive themselves, apparently acted as conduits for non-native parasites and insects.

Invasive Species Fates Identified

A new ecological study led by a University of Adelaide researcher should help identify species prone to extinction under environmental change and species that are likely to become a pests. The study, the first of its kind, provides good evidence that we can take any group of species and predict how each individual species will respond to changes in the environment through events such as climate change or habitat loss, says Corey Bradshaw, Associate Professor, University of Adelaide's School of Earth and Environmental Sciences. Dr. Bradshaw and colleagues analyzed life-history and ecological traits in more than 8900 species of the legume (Fabaceae) family, and found a correlation between evolved species traits and a particular susceptibility to a species becoming threatened or invasive. According to them, the urgency and scale of the global biodiversity crisis demands good generalized predictors of the likelihood of a species going extinct or becoming invasive in non-native areas. Developing evidence based on thumb rules for categorizing poorly studied species according to their susceptibility will aid decision makers in choosing the best ways to allocate finite conservation resources. Lists of species to watch both threatened and potentially invasive should be expanded based on ranking of susceptibility traits. The scientists feel that the results are particularly valuable where there is sustained habitat loss or fragmentation, especially given the predictions that climate change will simultaneously promote the expansion of invasive alien species and greater extinction rates in others.

New publications

Gassmann, A., Tosevski, I. and L. Skinner. 2008. Use of native range surveys to determine the potential host range of arthropod herbivores for biological control of two related weed species, *Rhamnus cathartica* and *Frangula alnus*. Biological Control, 45: 11-20.

Gerber, E., Krebs, C., Murrell, C., Moretti, M., Rocklin, R. and U. Schaffner. 2008. Exotic invasive knotweeds (*Fallopia* spp.) negatively affect native plant and invertebrate assemblages in European riparian habitats. Biological Conservation, 141: 646-654.

Feng, Y.L. and G.L. Fu. 2008. Nitrogen allocation, partitioning and use efficiency in three invasive plant species in comparison with their native congeners. Biological Invasions, 10: 891-902.